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San Juan Basin Action Plan

TRANSPORTATION TECHNICAL REPORT

for the
Environmental Impact Statement on Public Service Company of New Mexico's Proposed New Mexico Generating Station and Possible New Town

United States
Department
of the Interior

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Bureau of Land Management
New Mexico State Office
Santa Fe, New Mexico

October 1982

Report 20 of 22

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
P.O. BOX 1449
SANTA FE, NEW MEXICO 87501

IN REPLY REFER TO
NM30840EIS
1792.73(934A)

October 1982

Dear Interested Citizen:

Attached is one of twenty-two technical reports developed as a basis for writing the Environmental Impact Statement on Public Service Company of New Mexico's Proposed New Mexico Generating Station and Possible New Town (NMGS EIS). (A list of the technical reports is attached.)

These technical reports provide detailed information on the existing environment, methods used for the impact analysis, and related data supportive of the analysis and conclusions presented in the EIS. These reports should be retained for use with the Draft and Final EIS and other documents related to BLM's San Juan Basin Action Plan (SJBAP).

The Draft NMGS EIS will be filed with the Environmental Protection Agency and released for public review on November 30, 1982. Comments on the Draft EIS will be due by close of business February 7, 1983, at the BLM New Mexico State Office. Because of the large volume of material presented in the technical reports, the BLM is distributing these reports in advance of the Draft EIS to provide sufficient time for public review. The technical reports will be available for public review at the places indicated on the attached list. Copies will also be available from the BLM New Mexico State Office, U.S. Post Office and Federal Building, Santa Fe, for a copy fee.

Informational public meetings are scheduled for December 1982 to provide a public forum to clarify questions and concerns about the SJBAP proposals and the related environmental documents, which will all have been issued by that time. The meetings are scheduled as follows:

- December 14, Civic Center, Farmington, 3 to 9 PM
- December 14, Convention Center, Albuquerque, 3 to 9 PM
- December 15, Chapter House, Crownpoint, 3 to 9 PM
- December 16, Holiday Inn, Gallup, 3 to 9 PM
- December 16, Kachina Lodge, Taos, 3 to 9 PM

In addition, formal public hearings will be held in January 1983 to solicit public comments on the SJBAP Proposals. These meetings are scheduled as follows:

- January 10, Chapter House, Crownpoint, beginning at 1:00 PM
- January 12, Civic Center, Farmington, beginning at 9:00 AM
- January 14 (and 15th if necessary because of the number of registrants), Four Seasons Motor Lodge, Albuquerque, I-40 and Carlisle Blvd., beginning at 9:00 AM (each day)

Questions on the public meetings, hearings, and the technical reports themselves should be directed to:

Leslie M. Cone
NMGS Project Manager
BLM, New Mexico State Office
P.O. Box 1449
Santa Fe, NM 87501
(505) 988-6184 FTS 476-6184

Sincerely yours,

Charles W Luscher

Charles W. Luscher
State Director, New Mexico

List of Technical Reports

1. Purpose and Need
2. Project Description
3. Alternatives to the Project
4. Site Alternatives
5. Permit Reconnaissance
6. Air Quality
7. Geologic Setting
8. Mineral Resources
9. Paleontology
10. Soils, Prime and Unique Farmlands
11. Hydrology
12. Water Quality
13. Vegetation
14. Wildlife and Aquatic Biology
15. Threatened and Endangered Species
16. Cultural Resources
17. Visual Resources
18. Recreation Resources
19. Wilderness Values
20. Transportation
21. Social and Economic Conditions
22. Land Use Controls and Constraints

Availability of Technical Reports for Public Review

Individual copies of the technical reports can be obtained for a copy fee. Inquiries should be directed to:

Bureau of Land Management, New Mexico State Office
Title Records and Public Assistance Section (943B)
U.S. Post Office and Federal Building
P.O. Box 1449
Santa Fe, NM 87501
(505) 988-6107 FTS 476-6107

Copies of the reports are available for public review at the locations listed below. [Formal and informal cooperating agencies are denoted by an asterisk (*).]

BUREAU OF LAND MANAGEMENT OFFICES

New Mexico State Office

NMGS Project Staff (934A)
Room 122, Federal Building
Cathedral Place
P.O. Box 1449
Santa Fe, NM 87501
(505) 988-6184 FTS 476-6184

San Juan Energy Projects Staff (911)
Room 129, Federal Building
Cathedral Place
P.O. Box 1449
Santa Fe, NM 87501
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Public Affairs Staff (912)
Room 2016
U.S. Post Office and Federal Building
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Santa Fe, NM 87501
(505) 988-6316 FTS 476-6316

Division of Resources(930)
509 Camino de los Marquez, Suite 3
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Farmington, NM 87401
(505) 325-3581

Taos Resource Area Office
Montevideo Plaza
P.O. Box 1045
Taos, NM 87571
(505) 758-8851

Socorro District Office

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Carlsbad, NM 88220
(505) 887-6544

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Santa Fe, NM 87503
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Santa Fe, NM 87503
(505) 827-3326

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Bataan Memorial Building
Santa Fe, NM 827-3361
(505) 827-3361

New Mexico State Engineer's Office*
Bataan Memorial Building
Santa Fe, NM 87503
(505) 827-2423

New Mexico State Planning Office*
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Santa Fe, NM 87503
(505) 827-5191

OTHER ORGANIZATIONS

Public Service Company of New Mexico
Alvarado Square
P.O. Box 2268
Albuquerque, NM 87158
(505) 848-2700

Woodward-Clyde Consultants, Inc.
3 Embarcadero Center, Suite 700
San Francisco, California 94111
(415) 956-7070

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Reading copies of the NMGS EIS and associated technical reports will be available at the following public and university libraries:

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Albuquerque, NM 87102

Aztec Public Library
201 W. Chaco
Aztec, NM 87401

Crownpoint Community Library
c/o Lioness Club, P.O. Box 731
Crownpoint, NM 87313

Cuba Public Library
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Cuba, NM 87027

Farmington Public Library
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Farmington, NM 87401

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Gallup, NM 87301

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Bureau of Indian Affairs*
Eastern Navajo Agency
P.O. Box 328
Crownpoint, NM 87313
(505) 786-5228

Bureau of Indian Affairs*
Navajo Area Office
Box M - Mail Code 305
Window Rock, AZ 86515
(602) 871-5151 FTS 479-5314

Bureau of Reclamation*
Upper Colorado Regional Office
125 S. State Street
P.O. Box 11568
Salt Lake City, UT 84147
(801) 524-5463 FTS 588-5463

Minerals Management Service*
South Central Region
505 Marquette Avenue NW, Suite 815
Albuquerque, NM 87102
(505) 766-1173 FTS 474-1173

Minerals Management Service*
Resource Evaluation Office
411 N. Auburn
Farmington, NM 87401
(505) 327-7397 FTS 572-6254

National Park Service*
Southwest Regional Office
1100 Old Santa Fe Trail
Santa Fe, NM 87501
(505) 988-6375 FTS 476-6375

National Park Service*
Environmental Coordination Office
Pinon Building, 1220 St. Francis Drive
P.O. Box 728
Santa Fe, NM 87501
(505) 988-6681 FTS 476-6681

U.S. Fish and Wildlife Service*
Field Supervisor, Ecological Services
3530 Pan American Highway, Suite C
Albuquerque, NM 87107
(505) 766-3966 FTS 479-3966

U.S. Geological Survey (WRD)*
505 Marquette Avenue, Room 720
Albuquerque, NM 87101
(505) 766-2810 FTS 474-2817

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Dallas, TX 75270
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c/o Division of Resources
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Window Rock, AZ 86515
(602) 871-6592

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General Delivery
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Aztec, NM 87410
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Albuquerque, NM 87102
(505) 474-1676 FTS 474-1676

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Farmington, NM 87401

University of New Mexico, Gallup Campus
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TRANSPORTATION TECHNICAL REPORT

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Environmental Impact Statement on Public Service Company of New Mexico's Proposed New Mexico Generating Station and Possible New Town

Prepared by

Woodward-Clyde Consultants

for the

U.S. Department of the Interior
Bureau of Land Management

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NEW MEXICO GENERATING STATION

1.0
INTRODUCTION

BACKGROUND

Included in the recent Council on Environmental Quality Regulations (1979) are several important objectives to reduce excessive paperwork in the preparation of environmental impact statements (EISs):

- Discuss only briefly issues other than significant ones.
- Emphasize the portions of the EIS that are useful to decision makers and the public and reduce emphasis on background material.
- Prepare analytic rather than encyclopedic EISs.

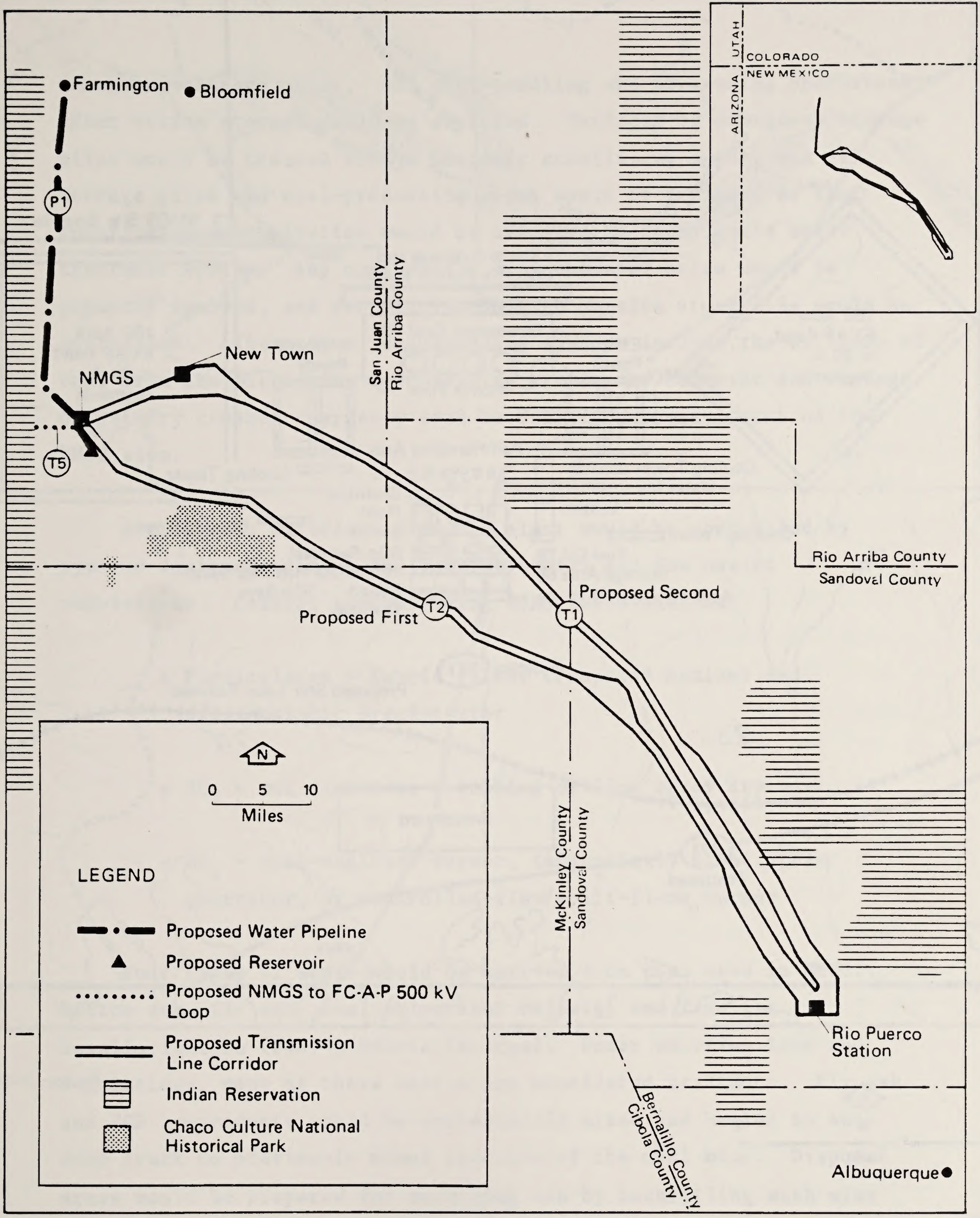
In order to accomplish these objectives and still provide the depth and background required for an analytic impact statement, this technical report has been prepared for the New Mexico Generating Station (NMGS) project. In this report, impacts that were not identified as significant but which are still considered important by the public or technical specialists are analyzed. Background material is provided for those issues and impacts that were considered necessary for the comparison of alternatives. Impacts that were not identified as significant or important by the public and by technical preparers are summarized, and reasons for their elimination from detailed analysis are discussed.

SUMMARY DESCRIPTION OF PROJECT COMPONENTS

Public Service Company of New Mexico (PNM) proposes to construct a 2000-megawatt (MW) coal-fired electric generation plant approximately 35 miles south of Farmington, New Mexico, in San Juan County (Map 1-1). The proposed NMGS, at ultimate development, would have four 500-MW generating units. Each generating unit would include a turbine generator area, coal pulverizer area, boiler area, particulate removal system, SO_2 removal system, and chimney stack. The proposed arrangement of these and other power plant components is shown in Figure 1-1. For the environmental analysis, it was assumed that commercial operation of the first 500-MW unit would begin in 1990 and that other units would start operating during the 1990s.

Coal for NMGS would be acquired through long-term contracts with Sunbelt Mining and Arch Minerals (Proposed Action) or other producers in the San Juan Basin (alternative coal supply). Coal acquired from a joint venture of Sunbelt and Arch Minerals would be supplied from surface mines (referred to as the Bisti mine in this analysis) in the immediate vicinity of the proposed plant site. Coal acquired from other producers in the San Juan Basin would be hauled from mines located as much as 30 miles from the proposed plant site. Coal required for NMGS would average 7.5 million tons per year, or a total of 300 million tons over the 40-year project life.

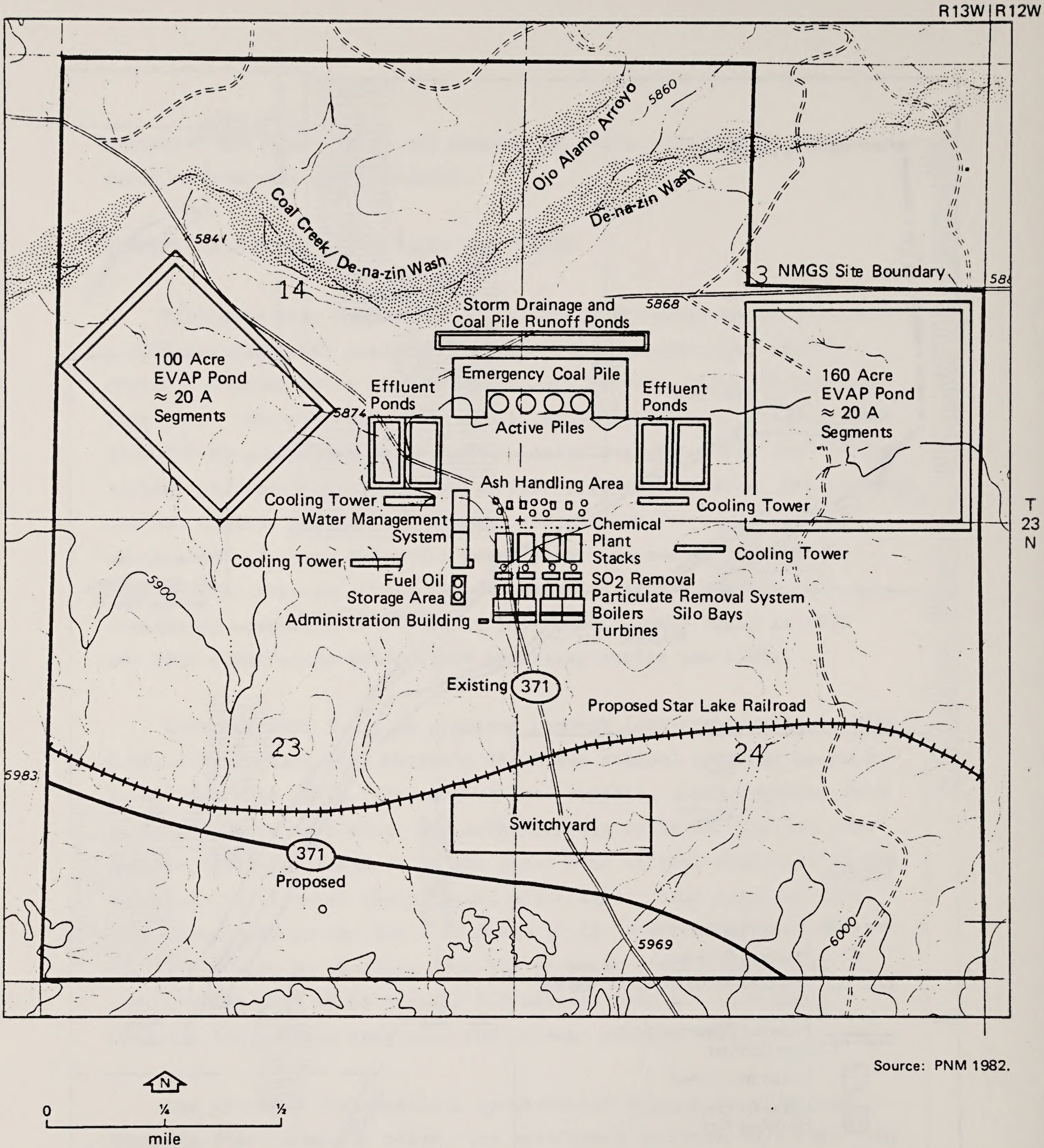
The proposed fuel-handling system would involve hauling coal from the Bisti mine (or other mine locations) by truck to a receiving facility located adjacent to the NMGS site. Coal would then be transferred via conveyor belt from the receiving station to active or



Note: For more information, see the location maps in Appendix G of the EIS.

Source: BLM 1982.

Map 1-1. GENERAL LOCATION OF PROPOSED ACTION



Source: PNM 1982.

Figure 1-1. STATION LAYOUT

emergency storage piles. All coal-handling and processing operations after active storage would be enclosed. Surfaces of emergency storage piles would be treated with a nontoxic stabilizing agent, and all storage piles and coal-processing areas would be designed so that runoff from precipitation would be diverted to the plant's water treatment system. Any coal spills from conveyor belts would be promptly removed, and percolation beneath on-site stockpiles would be controlled. Alternative fuel-handling systems include the delivery of coal from the Bisti mine to receiving station by conveyor and storage of primary crushed emergency coal on Sunbelt property north of the NMGS site.

Atmospheric emissions from the plant would be controlled by systems designed to meet applicable federal and New Mexico regulations. Control systems being considered include:

- Particulates - fabric filter (Proposed Action) and electrostatic precipitator
- SO_2 - wet limestone scrubbing or lime spray drying
- NO_x - dual-register burner, tangentially fired steam generator, or controlled-flow/split-flame burner

Four types of waste would be derived from coal used in NMGS: bottom ash, fly ash, coal pulverizer rejects, and flue gas desulfurization (FGD) products (sludge). Under existing laws and regulations, none of these wastes are considered hazardous. Fly ash and FGD by-products would be mechanically mixed and hauled by end-dump truck to previously mined portions of the coal mine. Disposal areas would be prepared for receiving ash by backfilling with mine overburden. Ash would then be dumped and spread in layers over the mine overburden. After the ash was placed and spread, it would be covered with layers of overburden and surface soil or topsoil and then a vegetative cover would be established. Bottom ash and pulverizer rejects would be collected for disposal in dewatering bins and then hauled by end-dump trucks for disposal into previously mined portions of the coal mine. Procedures for disposal would be the same as for fly ash.

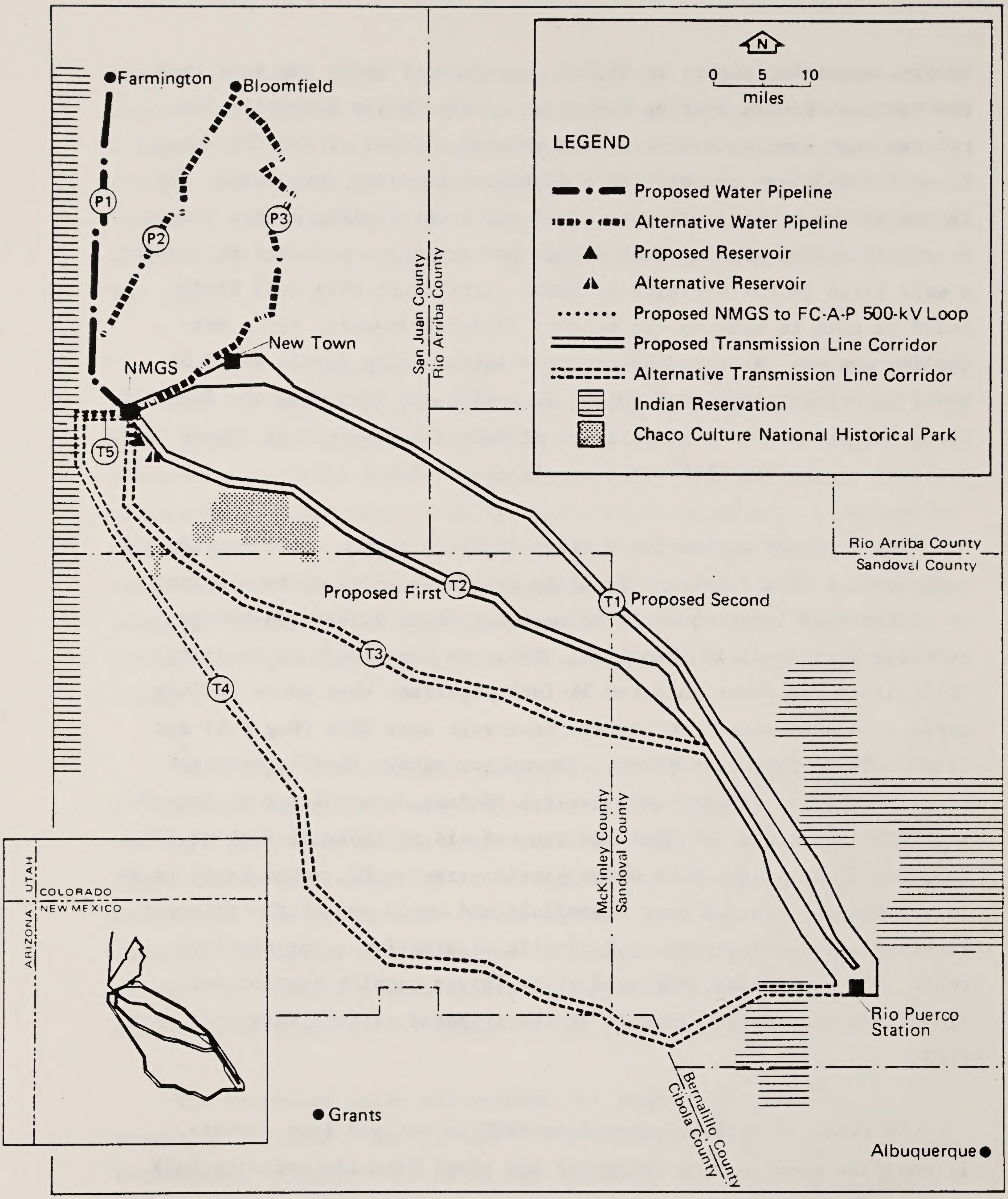
The water management system would contain all equipment necessary to treat and supply all the plant makeup water and potable water. The power plant would be designed and operated as a zero-discharge plant; wastewater would be reused by cascading it to uses requiring successively lower water quality. Used water, degraded to the extent that it could not be economically treated for further in-plant use, would be used for transport and disposal of plant-generated wastes or would be discharged to evaporation ponds (Figure 1-1). Evaporation ponds would be lined with impervious material to limit seepage losses.

Water supplies available for NMGS are believed to be sufficient to construct an all-wet heat-rejection system, based on evaporative cooling, and to use forced-draft cooling towers (Figure 1-1). Cooling-tower makeup water would be drawn from the nearby raw-water storage reservoir. The makeup water would replace the tower losses from evaporation, drift, and blowdown. If sufficient water could not be secured for a totally evaporative system, a water-cooling system employing both dry and conventional wet towers might be required.

The estimated water requirement for NMGS, with four units operating at rated capacity and a heat-rejection system equipped with wet-cooling towers, would be 35,000 acre-feet per year. In order to supply this quantity of water to NMGS, the Proposed Action would involve acquiring rights to 35,000 acre-feet of water per year from the San Juan River, storing the water in the Navajo Reservoir for release upon demand, and using the natural channel of the San Juan River for delivery of water to a diversion facility downstream. If the total quantity of water required for a wet-cooling system cannot be acquired from the San Juan River, the applicant proposes to develop a well field in the vicinity of NMGS. Water from this well field would be used to make up the balance of water required for a wet-cooling system. A second alternative water supply system would be based on a total supply of 20,000 acre-feet per year from the San Juan River and the use of a combination of wet- and dry-cooling towers designed to perform within the supply constraint.

The Proposed Action for a water delivery system would include the construction of a diversion facility in the vicinity of Farmington; an alternative location would be near the State Highway 44 bridge crossing at Bloomfield (Map 1-2). Pumps at the diversion facility would discharge water into two 36-inch pipelines that would deliver water to a 4000-acre-foot storage reservoir near NMGS (Map 1-1) and ultimately to the power plant. The approximately 40-mile proposed pipeline (P1) would generally require 90-foot construction rights-of-way (ROW) and would parallel the new and old portions of Highway 371 (Map 1-1). An alternative water pipeline route, P2, would begin at an intake pumping station near Bloomfield and would end at the proposed terminal storage reservoir. A 49-mile alternative water pipeline route, P3, would also originate at an intake pumping station near Bloomfield and would terminate at the proposed storage reservoir near NMGS.

In order to deliver power from NMGS to various load centers, it would be necessary to integrate the plant into the existing bulk



Note: For more information, see the location maps in Appendix G of the EIS.

Source: BLM 1982.

Map 1-2. GENERAL LOCATION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION transmission systems of PNM and neighboring utilities. Thus the proposed transmission system would consist of a 500-kilovolt (kV) loop linking NMGS with PNM's approved 500-kV Four Corners-Ambrosia-Pajarito (FC-A-P) line, located approximately 5 miles west of NMGS, and two 500-kV lines linking NMGS with the Albuquerque distribution and load center at the proposed Rio Puerco Station (Map 1-1). The NMGS-Albuquerque system would be installed in phases: the 500-kV loop in 1990 with commencement of commercial operation of Unit 1, the first 500-kV line with Unit 2 in 1993, and the second 500-kV line with Unit 4 in 1998.

Four routes are considered technically and economically feasible for construction of the 500-kV transmission system. Route T2 is proposed for the first 500-kV line and route T1 is proposed for the second 500-kV line; routes T3 and T4 are alternatives to the Proposed Action. The total distance traversed would be similar for the two proposed and two alternative corridors: 101 miles (T2), 107 miles (T1), 105 miles (T3), and 126 miles (T4). With the exception of tower sites, the proposed 200-foot ROW could support other compatible land uses, such as grazing. PNM would keep the transmission line ROW closed and would patrol the line by helicopter each month. Lands disturbed by heavy equipment and temporary access roads would be restored to their original condition.

Table 1-1 displays construction work force estimates over time. Construction employment for station facilities would reach peaks of 1515 employees in 1987 and 1530 employees in 1992. Operations employment at station facilities would increase steadily, from 30 employees in 1989 to 900 employees in 1999 when all four units are expected to be on-line.

Table 1-1. NMGS CONSTRUCTION AND OPERATION EMPLOYMENT

Year	Intake Pipeline and Reservoir	500-kV Transmission Line	NMGS										Total Employment	Annual Change
			Construction					Operation						
			Unit 1	Unit 2	Unit 3	Unit 4	Total	Unit 1	Unit 2	Unit 3	Unit 4	Total		
1985	—	—	85	—	—	—	85	—	—	—	—	—	85	+85
1986	—	—	800	—	—	—	800	—	—	—	—	—	800	+715
1987	115	—	1515	—	—	—	1630	—	—	—	—	—	1630	+830
1988	295	104	1180	30	—	—	1505	—	—	—	—	—	1505	-125
1989	—	—	360	450	—	—	914	30	—	—	—	30	944	-560
1990	—	—	100	940	40	—	1080	200	—	—	—	200	1280	+336
1991	—	—	—	750	570	—	1320	250	—	—	—	250	1570	+290
1992	—	—	—	270	1260	—	1530	250	24	—	—	274	1804	+234
1993	—	—	—	105	955	30	1090	250	160	—	—	410	1500	-304
1994	—	78	—	—	325	435	838	250	200	30	—	480	1318	-182
1995	—	—	—	—	90	940	1030	250	200	200	—	650	1680	+362
1996	—	—	—	—	—	775	775	250	200	250	—	700	1475	-205
1997	—	—	—	—	—	255	255	250	200	250	24	724	979	-496
1998	—	—	—	—	—	95	95	250	200	250	160	860	955	-24
1999	—	—	—	—	—	—	0	250	200	250	200	900	900	-55

Source: PNM 1980, unpublished data.

According to PNM (unpublished data, 1980), estimated construction employment skill requirements would be as follows:

Skill	Percent of Total Construction Work Force
Boilermakers	9.4
Pipefitters	14.2
Electricians	14.4
Carpenters	5.6
Ironworkers	10.0
Operators	10.0
Laborers	9.0
Teamsters	4.1
Cement masons	0.8
Millwrights	3.3
Insulators	4.0
Sheetmetal workers	1.1
Painters	1.2
Others	0.5
Supervision	12.4

The above estimates are averaged for construction of all four units.

SAN JUAN BASIN ACTION PLAN OVERVIEW AND RELATIONSHIP OF THE NMGS EIS TO ACTIONS INCLUDED IN THE PLAN

The proposed site for the NMGS is located in the San Juan Basin of northwestern New Mexico. The Bureau of Land Management (BLM) is responsible for the management of much of the land and mineral resources in this area, and currently has six separate but interrelated proposals under consideration within the basin. In order to respond to these, the BLM has developed a San Juan Basin Action Plan (SJBAP). This plan provides for the organizational arrangements whereby the environmental analyses and decision making can be implemented in a timely and efficient manner. The plan describes the process for preparation of three site-specific EISs (including the NMGS EIS) and three Environmental Assessments (EAs):

- Coal Preference Right Lease Applications (EA)
- San Juan River Regional Coal Leasing (EIS)
- Wilderness Study Areas (WSAs) (EIS)
- New Mexico Generating Station (EIS)
- Ute Mountain Land Exchange (EA)
- Bisti Coal Lease Exchange (EA)

In addition to these documents, the action plan provides for the preparation of a Cumulative Overview (CO). The CO is intended to focus on the cumulative impacts that would result from the proposed actions analyzed in the EISs and EAs listed above and therefore to facilitate public review and decision making. As a result of this organization, the impact analysis in the NMGS EIS and technical background reports concentrates on the impacts expected to result from the specific NMGS components proposed. The cumulative impacts expected to result from the proposed NMGS, in addition to the cumulative impacts of other proposals to be developed in the same time period, are described in the CO.

BASELINE CONDITIONS ASSUMED FOR THE NMGS TECHNICAL REPORT IMPACT ANALYSES

The site-specific impact analysis for this technical report was based on the affected environment and available resources that would be existing at the time of construction and operation of the NMGS facility. Since construction at the NMGS facility would not begin until 1985, certain assumptions regarding project development in the San Juan Basin were necessary. Two levels of project development were considered, along with criteria for each, in developing a status for the various non-SJBAP actions proposed for the San Juan Basin area.

- Baseline 1 - The projects considered in this level of development are those that have approval and are to be built or under construction in 1985. This level represents the projected existing environment without the proposals included in the SJBAP.

- Baseline 2 - The projects considered in this level are in some phase of the application stage. In this level, Baseline 1 projects are added to any projects in Baseline 2 along with any revision in resource production or uses (e.g., coal).

Where differences in Baselines 1 and 2 affect the results of impact analyses, discussion is provided. If no differences are identified, it should be assumed that consideration of the two different baselines did not alter the impact analyses.

A complete list of projects and comprehensive location maps for Baselines 1 and 2 are provided in Appendix C of the NMGS EIS.

ORGANIZATION OF THE REPORT

Section 2.0 of this technical report describes the assumptions and methodological approach used in the assessment of potential impacts of the Proposed Action on the affected environment. In addition, Section 2.0 contains a definition of the study area and identification of data sources.

Section 3.0, Affected Environment, contains baseline data on existing conditions in the study area, as well as projections of future conditions without the Proposed Action. Information on historical trends is presented where it is useful in providing a basis for predicting most likely future trends. The description of projected future trends takes into consideration the changes in the environment that are expected to occur as a result of the projects identified in Baseline 1. This provides a reasonable estimate of the future existing environment against which the potential impacts of the Proposed Action and alternatives can be assessed.

Section 4.0 describes the potential effects of implementing the Proposed Action and alternatives. Impacts identified are measured against indicators of significance in order to estimate the importance of the impact to the affected human environment. (Potential impacts associated with alternatives to the Proposed Action are compared in Section 9.0.)

In Section 5.0, mitigation measures are suggested. These measures would help to alleviate the potentially significant adverse impacts or enhance the beneficial impacts identified in the Section 4.0 analysis. Those potentially adverse impacts for which no appropriate mitigation measures have been suggested are discussed in Section 6.0 as "unavoidable adverse impacts."

2.0

FRAMEWORK FOR ANALYSIS

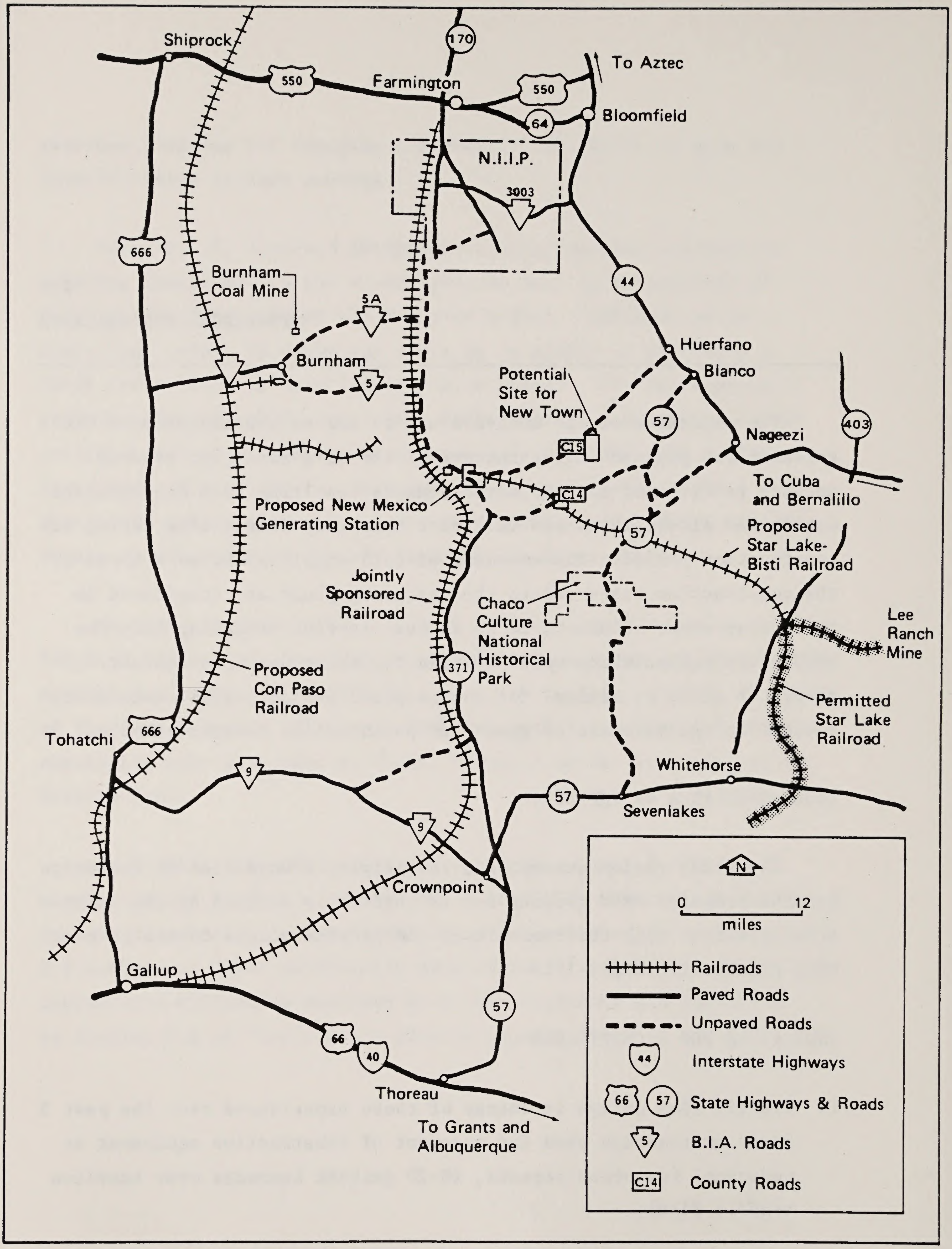
The objective of the analysis was to assess the adequacy of the existing and planned infrastructure of the air, rail, and roadway network to (1) meet the projected demands resulting from the Proposed Action and alternatives and (2) incur temporary disruptions during the construction period. The movement of both supplies and work force to the construction sites and to the operating plant are considered in this assessment. Since there is no rail service extending into the NMGS study region which could be used for these purposes and air transport would be minimal for the proposed project, this assessment focuses on the movement of goods and personnel by roadway vehicles.

GEOGRAPHIC AREA OF INFLUENCE

The study region encompasses the primary communities of residence for the proposed NMGS project and is physically defined by the major arterials that link the communities and provide access to the proposed NMGS plant site (Map 2-1).

INDICATORS FOR SIGNIFICANCE

1. Traffic flow delays in excess of those experienced over the past 5 years on roadways used for movement of construction equipment or personnel (on urban streets, 10-20 percent increase over baseline traffic flow).



Source: BLM 1982.

Map 2-1. MAJOR TRANSPORTATION ROUTES IN THE SAN JUAN BASIN

2. An increase in traffic accidents in excess of those reported for roadways used for movement of construction equipment or personnel over the past 5 years.

3. Use of roadways already deficient in safety, surface foundation, or capacity.

DATA COLLECTION

The primary reference for this assessment was a background technical report prepared in consort with this study, by Adcock and Associates, Inc., of Albuquerque, New Mexico. Other data came from published transportation reports and phone conversations with highway personnel, as listed in the References section. Traffic volume and accident data were not available for some sections of roadway (e.g., N.M. 371 from Bisti north to Farmington), and rail proposals were still in the formulative stage of development at the time of this study.

INTERRELATIONSHIPS WITH BASELINES 1 AND 2

The basic differences in the effect of Baselines 1 and 2 on the extent of transportation consequences is that Baseline 2 includes the addition of another coal-haul railroad (Con Paso) and a number of permitted uranium and coal mines. The combination of these actions, however, would serve to balance out some of the impacts to the roadway system by relieving roads of truck traffic. Movement of personnel would result in additional traffic volume along major access roads (N.M. 371), which would increase accident potential and road maintenance requirements.

3.0

AFFECTED ENVIRONMENT

In this section, the regional infrastructure supporting air, rail, and roadway movement for San Juan and McKinley counties is addressed first; then municipal transportation and traffic conditions in each of the affected communities are considered.

REGIONAL TRANSPORTATION

Regularly scheduled and contract transportation services within the study region include rail service along the southern border, air, bus, and trucked freight.

Rail Service

There is presently no rail service available to the population centers in San Juan County; however, two rail corridors are being discussed: the Star Lake spur, running 114 miles north from the Santa Fe line at Prewitt to Bisti and Star Lake; and the Con Paso line, connecting just west of Gallup and running north (with a spur to the NMGS site) to just west of Farmington. Both are proposed for operation around 1985. A third off-reservation rail line has also been proposed to extend from Gallup north to Farmington along N.M. 371 on the eastern edge of the Navajo Reservation. This line would be jointly sponsored by the state, the coal companies, and Colorado entities. All three rail lines are designed to haul coal from mines in San Juan and McKinley counties.

The Star Lake rail spur, proposed by the Santa Fe Mining Company, is furthest along in obtaining the necessary ROW permits (federal and state have been granted) and obtaining Interstate Commerce Commission (ICC) approval (convenience and necessity approval granted January 28, 1982) for the section of line running up to Milepost 23.1 near Gallo Wash, referred to in Document 1.

The approved segment will serve the Lee Ranch Mine. Condemnation hearings have not yet been held by the District Court; however, plans still include operation by 1985.

The proposed extension of the Star Lake railroad from Milepost 23.1 (Gallo Wash), running northwest past Pueblo Pintado, north of Chaco, and past the Bisti WSA to the Navajo Reservation border is a part of the second document submitted to the ICC for approval. This segment has not been approved by the ICC, nor have specific financial plans been developed by mining companies for its operation (Byers 1981).

Air Service

Scheduled air service to the Farmington Municipal Airport is provided by four airlines (Frontier, Mesa, Sun West, and Air Midwest). There are currently 20 flights in and 20 flights out a day; major connections are with Albuquerque, Denver, and Phoenix.

Two charter air services operate regularly out of the Farmington Municipal Airport. Other charter and nonscheduled air freight services also have access to the Farmington Airport and the Aztec Airport (Adcock 1981).

Bus Service

Five regularly scheduled intercity buses arrive daily in Farmington: two from Albuquerque, one from Denver, one from Salt Lake

City, and one from Gallup. The scheduled service is provided by Trailways, Inc. Charter bus service within the region is also available (Adcock 1981).

Freight Service

Thirty trucking firms have offices within San Juan County; most are in Farmington. Freight services provided include interstate and local motor freight, liquid and dry bulk transport, and heavy equipment hauling (Adcock 1981).

Highway System

Because rail service is not now available to the Four Corners region, the highway system is the major mode for moving goods, equipment, and people. Several state and federal highways serve the two-county area (Map 2-1), but foundation, surface, safety, and capacity deficiencies plague some segments of almost every major roadway in the region. The most recent traffic flow information available for major non-urban roads is dated 1977. According to a 1981 New Mexico State Highway Department (NMSHD) report, some of these deficiencies will be remedied under a five-year improvement plan. In response to the consequences of past energy resource development, the NMSHD has proposed or begun major new construction or renovation projects for all but one of the highways described below.

U.S. 550, a paved four-lane divided highway is a primary east-west route traversing 57.1 miles of rolling terrain from Shiprock through Farmington and Aztec to the Colorado state line. Segments of U.S. 550 between Shiprock and Aztec are paved two-lane highway (2.7 miles), as are the 13.1 miles from Aztec north to the New Mexico-Colorado line. The NMSHD classifies U.S. 550 as a principal arterial that carries a high volume of commuter and service vehicle traffic (e.g., over 10,000 vehicles per day between Shiprock and Bloomfield in

1977). U.S. 550 is the primary access route between the residential population centers of San Juan County and several major employers, including the Four Corners Power Plant, the San Juan Generating Station (construction on Unit 4 at San Juan Generating Station is scheduled for completion in 1982), and the Utah International coal mine. A large volume of coal traffic is expected in the next three years, adding to the already high traffic levels.

The segments of two-lane highway between Shiprock and Aztec have recently been the sites of major congestion problems. A $2.6 million construction project is upgrading these sections to four-lane divided highway. Once completed, U.S. 550 will be a four-lane divided highway over its entire 41.3 miles from Shiprock to Aztec (NMSHD 1981).

The second principal east-west arterial is U.S. 64, which connects U.S. 550 from a junction in Farmington to N.M. 44 at a junction in Bloomfield, a distance of 12.2 miles over flat to rolling terrain. Although U.S. 64 carries a high volume of commuter and service vehicle traffic, its present configuration and capacity are judged to be adequate by the NMSHD. Since there are no present or projected deficiencies on U.S. 64, no improvement or new construction is planned in the near future.

The third principal arterial running north-south, N.M. 44, provides the main connection between the Four Corners region and the interstate highway system as well as the Albuquerque and Santa Fe metropolitan areas. This highway is also the most frequently used route to Chaco Culture National Historical Park, connecting both Farmington and Albuquerque via N.M. 57 with the northern park entrance. N.M. 44 begins at a junction with U.S. 550 in Aztec and runs through Bloomfield (U.S. 64 junction), Cuba, and San Ysidro, and joins Interstate 25 at Bernalillo, 160.2 miles southeast of its origin. This two-lane highway is one of the more heavily traveled noninterstate rural routes in New Mexico. The state projects that N.M. 44 will carry as many as 300 coal-truck trips a day in the next 1 to 3 years (NMSHD 1981), moving coal from mines in San Juan Basin (Star Lake Mine and La Ventana Mine) to Albuquerque/Santa Fe. This road could also become a major commute route to mine areas from Albuquerque.

Because of increasing traffic volume, proposed expansions of coal mining activity along N.M 44, and its general importance to the Four Corners area, various sections of N.M. 44 have recently been upgraded; further improvements are scheduled in the near future. Projects to improve 8.5 miles of this roadway are presently under contract (NMSHD 1981). Other projects totaling 51 miles are scheduled in the NMSHD five-year plan, leaving approximately 30.4 miles of deficient roadway unscheduled for improvement. Scheduled and unscheduled improvements to N.M. 44 are estimated to cost $59 million (1980 dollars).

N.M. 57 and N.M. 371 combine to provide direct access between Farmington and Interstate 40 at Thoreau. N.M. 371 is also the main route directly from Farmington to the proposed NMGS plant site, approximately 35 miles south of downtown Farmington. From Thoreau to Farmington, N.M. 57/371 covers 106.1 miles of flat to rolling terrain, with a short mountainous section near each end of the corridor. About 40 miles of N.M. 57/371 are unpaved but graveled; the 66 paved miles are two-lane roadway. A series of construction projects has been proposed by the NMSHD to complete the paving of the total length of two-lane roadway; however, some 27.3 miles are not yet programmed for construction. Total estimated cost of these projects is $34.5 million (1980 dollars). Once completed, N.M. 57/371 will be a minor north-south arterial designed to relieve U.S. 666 and N.M. 44 of some of their roadway deficiency and capacity problems (NMSHD 1981). Traffic volume along the southern portion of 57/371 from Thoreau to Bisti has been moderate since 1978, when uranium activities scaled down.

Two other highways in the area are scheduled by the NMSHD for major improvements over the next five years. U.S. 666, a major arterial, is the primary north-south route connecting Gallup to Shiprock and the Four Corners area. Covering 90.4 miles of flat to rolling terrain from Interstate 40 to U.S. 550, this highway has four-lane and two-lane segments. At present, U.S. 666 is paved along its entire length, and 39 miles of resurfacing and widening projects are in progress to upgrade deficient segments. These projects, identified in the NMSHD five-year plan, will also provide for anticipated increased volumes of general traffic and coal-truck movement. The planned improvements are to cost about $20.5 million (NMSHD 1981).

N.M. 170, a major collector, runs north from a junction with U.S. 550 west of Farmington to the New Mexico-Colorado state line, a distance of 18.8 miles. This highway is a narrow, paved two-lane route that was rated in 1978 as deficient in safety along its entire length. Five bridges along the route are being replaced, and the NMSHD has proposed a $4 million project to reconstruct the southern 6.5 miles of N.M. 170 in the near future.

In summary, of the major roads serving the study region, deficiencies are anticipated to exist on both N.M. 44 from Bloomfield south and on N.M. 57/371 from Farmington to Thoreau, two of the three north-south routes connecting Gallup and Albuquerque with Farmington and Bloomfield.

East-west connectors in the study are also deficient. At present, Navajo 5A connects U.S. 666 and N.M. 371 from the Burnham Trading Post to 10 miles north of the proposed NMGS site. This route will provide the primary access to the CONSOL coal mining area for both haul trucks and commuters. Approximately half of this road is lightly graded dirt, programmed for bituminous surfacing by 1990. The only other east-west connectors are unimproved county roads (C-15 and C-14) between N.M. 44 and 371. Current traffic on these narrow, graded dirt roads is estimated to be fewer than 20 vehicles a day. There are no ditches or culverts for roadway drainage, making the roads nearly impassable during inclement weather.

Safety is one of the primary deficiencies of highways in the San Juan-McKinley county network. These two counties ranked in the top three, statewide, for total highway fatalities per million vehicle miles for the period 1974-1977 (Williams 1979). San Juan County reported 60 annual deaths and 2719 total annual accidents for the 3-year period, while McKinley County reported 73 annual deaths and 2464 total annual accidents.

Of particular concern to this assessment are accident trends along the primary road to the plant site--NM 57/371 from Thoreau (I-40) north to the Bisti site, and the proposed 371 from Farmington south to the site. Since the northern portion of the roadway is still under construction, no data have been collected for this portion of roadway.

For the southern portion from Thoreau to Bisti, the accident trend, consistent with a decrease in traffic volume, has shown a downward shift from 1979 to 1981 (87 total accidents reported for 1979, 73 in 1980, and 64 in 1981). Of the total 224 accidents reported for the 3-year period, 10 were fatal, 77 involved injury, and 137 involved property damage. The most prominent accident types were single rollovers and animal collisions (unattended cows and horses).

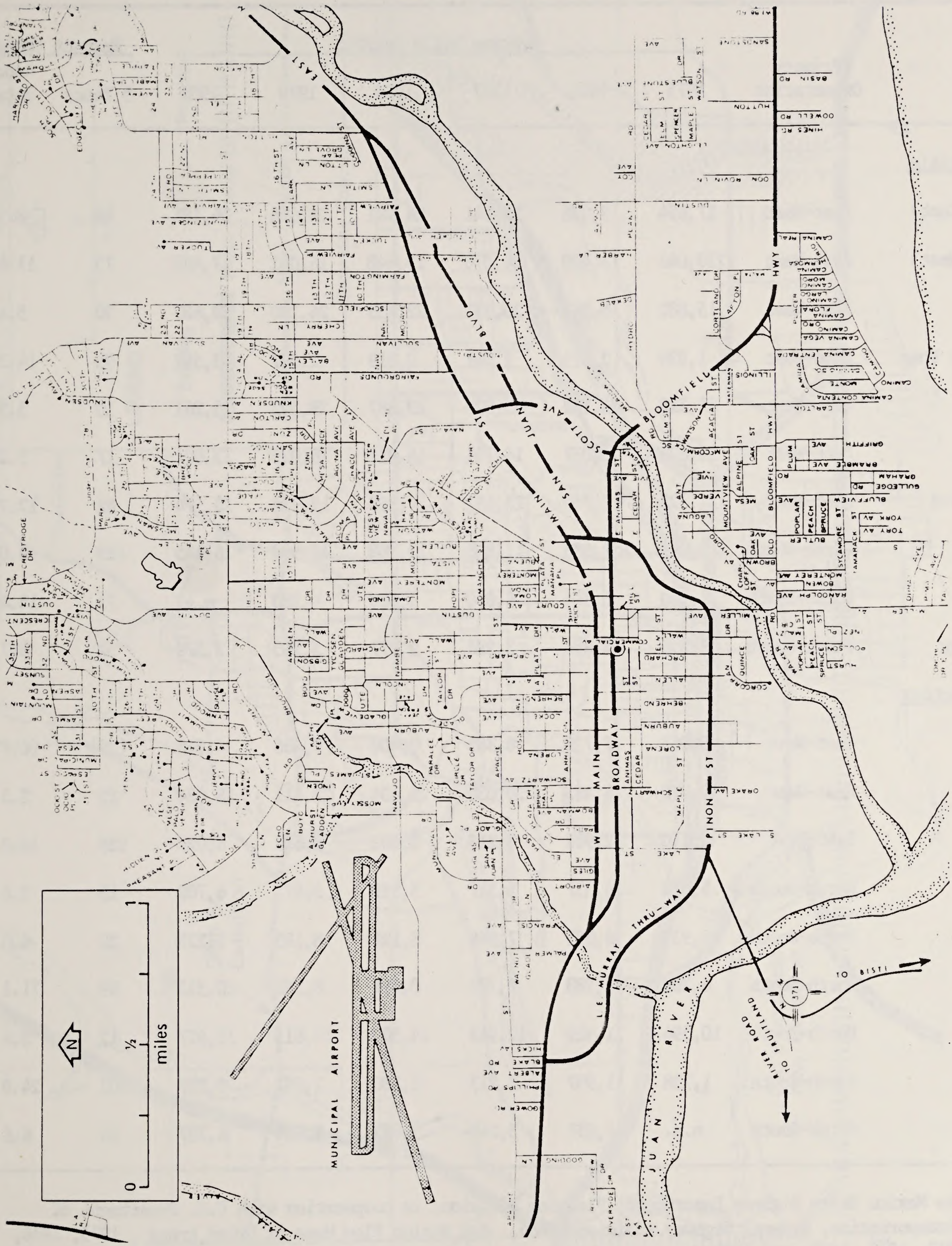
MUNICIPAL TRANSPORTATION AND TRAFFIC

Since no intracity bus service is presently available, transportation within the three primary communities of residence (Farmington, Aztec, and Bloomfield) is by private motor vehicle. The following discussion summarizes traffic conditions and problems in each community.

Farmington

Two federal highways (U.S. 550 and U.S. 64, both principal arterials) feed traffic into the eastern portion of Farmington (Map 3-1). Traffic originating locally joins this intercity traffic and is funneled along the Main and Broadway roadways through the central business district (CBD) to U.S. 550 on the west side of the CBD. Since none of the major routes bypass the CBD, the combination of commuters and shoppers in the downtown area frequently causes congestion on both the arterials and collectors in the CBD.

Table 3-1 presents a five-year comparison of average daily traffic flows on major arterials and major collectors in Farmington. As the table shows, traffic has increased at a rate greater than 5 percent annually on almost every major street in Farmington. Several major construction, realignment, resurfacing, and improvement projects for Farmington's streets are underway or are planned for the near future (Map 3-2), including an east-west connector between La Plata Highway and East Main at the north of town, and U.S. 64 and Main Street at the east of town. The Old Bloomfield Highway extension, connecting La Plata Highway and Route 64, has been proposed by the city but has not received state approval or funding. This route would connect eastern residential developments in Farmington with N.M. 371 and would avoid passing through the main downtown. Traffic accidents in Farmington for 1980 showed 12 fatalities (up 4 from the previous



Map 3-1. FARMINGTON MUNICIPAL ROAD SYSTEM

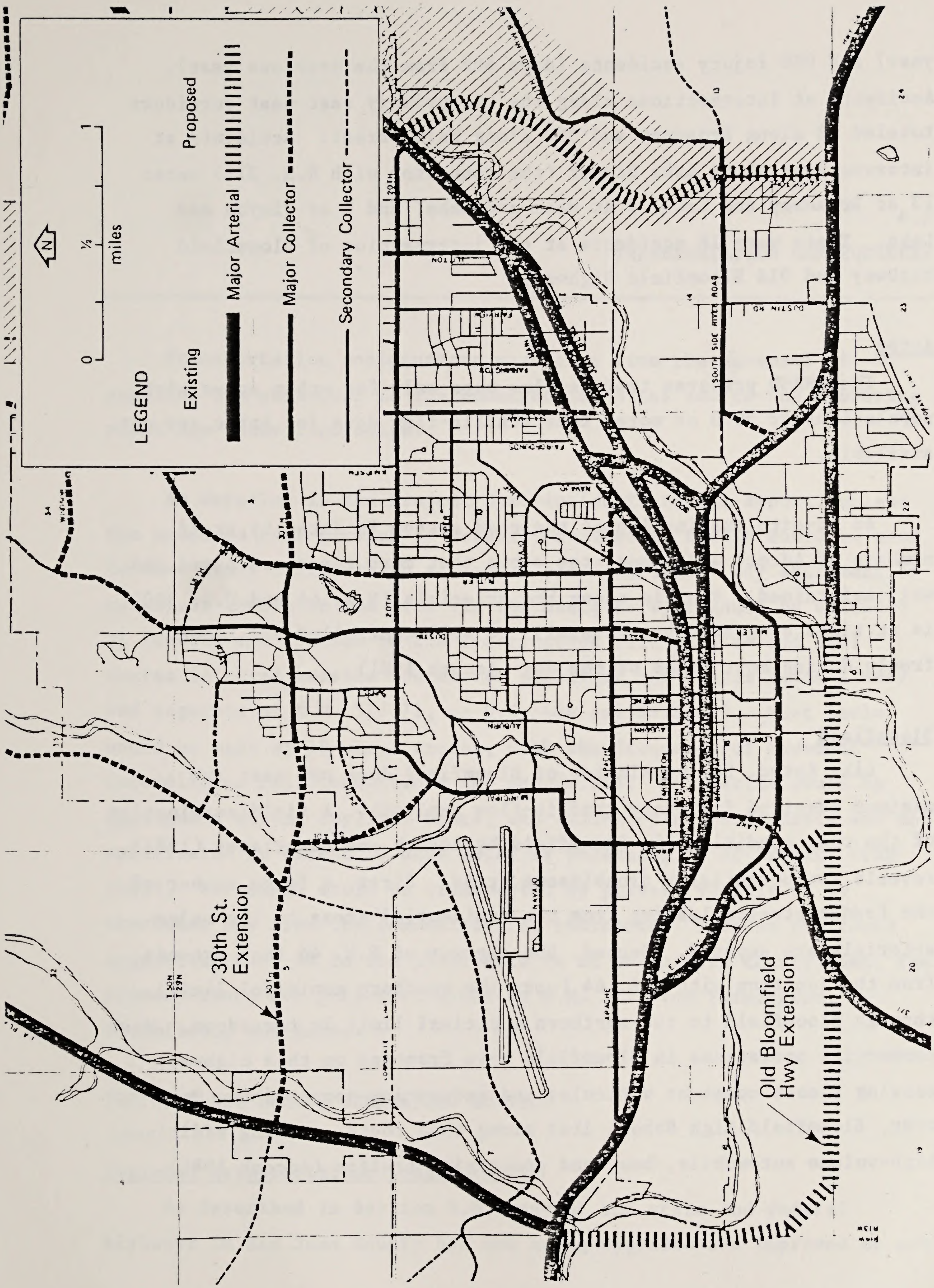
Table 3-1. AVERAGE DAILY TRAFFIC FLOWS IN FARMINGTON

		Average Daily Traffic						Percent Change	
Name	Primary Orientation	1975	1976	1977	1978	1979	1980	5 Years	Annual Rate*
Major Arterials									
U.S. 550 (East)	East-West	17,694	19,926	22,041	26,491	26,676	26,185	48	8.2
U.S. 550 (West)	East-West	10,041	11,409	14,070	15,348	16,042	17,421	73	11.6
U.S. 64	East-West	15,882	18,217	20,531	22,253	24,280	20,687	30	5.4
L.E. Murray Thwy	East-West	1,839	2,071	2,247	2,519	2,537	3,592	95	14.3
Main	East-West	21,228	24,161	25,935	29,387	29,593	25,261	19	3.5
Broadway	East-West	11,623	13,087	14,191	15,917	16,028	13,601	17	3.2
San Juan Blvd	East-West	11,323	12,750	17,667	19,816	19,955	20,574	82	12.7
Scott	North-South	7,045	7,933	11,836	13,268	13,640	16,135	129	18.0
N.M. 371	North-South	2,500	3,394	4,060	4,500	4,280	n.a.	71	14.4
La Plata Hwy	North-South	2,355	2,654	3,284	2,277	3,195	3,579	52	8.7
Major Collectors									
Apache	East-West	6,863	7,728	8,385	9,400	9,466	4,846	(29)	(6.7)
20th	East-West	16,072	18,461	20,030	22,454	22,611	18,034	12	2.3
30th	East-West	2,630	2,961	3,213	3,602	3,627	6,023	129	18.0
Airport	North-South	5,828	6,337	5,517	5,929	5,971	6,702	15	2.8
Municipal	North-South	5,933	6,681	7,249	8,126	8,183	7,225	22	4.0
Dustin	North-South	6,202	6,983	7,577	8,494	8,553	10,512	69	11.1
Butler	North-South	10,594	11,929	12,943	14,509	14,611	11,927	12	2.4
Sullivan	North-South	1,738	1,957	2,213	2,380	2,397	5,257	202	24.8
Hutton	North-South	n.a.	4,837	5,248	5,883	5,924	6,237	29	6.6

Sources: New Mexico State Highway Department, Planning Division, in cooperation with U.S. Department of Transportation, Federal Highway Administration, New Mexico Flow Maps of Urban Areas , 1975, 1976, 1977, 1978, 1979, and 1980.

n.a. = not available (percent change based on 4 years of data).

*Compound rate.



Map 3-2. PROPOSED IMPROVEMENTS TO FARMINGTON MUNICIPAL ROAD SYSTEM

year) and 920 injury accidents (down 492 from the previous year). Accidents at intersections along the two primary east-west corridors totaled 92 along Broadway and 390 along Main Street. Accidents at intersections along Lake Street (the connector with N.M. 371) were: 13 at Broadway and Lake, 9 at Main and Lake, and 9 at Pinyon and Lake. There were 18 accidents at the intersection of Bloomfield Highway and Old Bloomfield Highway.

Aztec

The NMSHD prepares traffic-flow maps only for urban areas with populations of 5000 or more; thus traffic-flow data for Aztec are not available.

An on-site examination of the road system in Aztec by staff members of Adcock and Associates shows that most roads are paved and well maintained. Traffic along the arterials (N.M. 44 and U.S. 550) is at times congested but, overall, is well controlled and flows freely during most times of the day (Adcock 1981).

Bloomfield

Like Aztec, the population of Bloomfield does not meet the minimum required for state traffic-flow analysis. A field examination of the road conditions in Bloomfield by Adcock and Associates (1981) reveals two potentially troublesome areas. First, a large number of the feeder streets leading from the residential areas to the major arterials are unpaved. Second, the segment of N.M. 44 that extends from the junction with U.S. 64 (near the southern municipal limit) through Bloomfield to the northern municipal limit is hazardous. Most commercial operations in Bloomfield have frontage on this highway, causing almost constant vehicular and pedestrian congestion. Moreover, Bloomfield High School lies along this route, causing additional high-volume automobile, bus, and pedestrian traffic (Adcock 1981).

4.0

TRANSPORTATION CONSEQUENCES

Transportation consequences resulting from the movement of supplies and personnel to the construction sites and to the operating plant are identified below.

As detailed in the Project Description Technical Report, unless the proposed rail service is actually available, trucks would be used to move heavy construction equipment and materials. Any equipment or materials coming to the area via the Santa Fe spur would be unloaded at Prewitt and trucked to the construction site on off-road haul routes (cleared service routes for pipelines and transmission lines) and segments of N.M. 57/371, or U.S. 666 and Navajo 9. Most hauls would be made by 18-wheel trucks, with the frequency of movement depending on rail connections and scheduling. Deliveries would be continuous during daylight hours, and rail-to-plant site hauls are not anticipated to exceed 50 days total if unloading is at Prewitt (PNM 1981). Personnel would be transported by private vehicle or by chartered bus from the communities of residence. Because the route connecting N.M. 44 to the plant site is an unimproved county road, the primary route for personnel would be N.M. 371 from Farmington, Bloomfield, and Aztec.

PROPOSED NEW MEXICO GENERATING STATION

Regional Transportation Consequences

As described in Section 3.0, many of the state and federal highways in San Juan County are now being upgraded and improved or are scheduled for improvement to meet the combined demand of the growing population and the expansion of energy resource development.

Two key projects will strongly affect the adequacy of the highway system in meeting the needs of the proposed NMGS. Segments of N.M. 371 are presently being upgraded so that the entire length from Thoreau to Farmington will be two-lane paved roadway. A series of construction projects to finish this roadway is scheduled to be completed in 1984 (Duffy 1981). If the schedule is met, there would be direct access to the site of the NMGS along a paved two-lane roadway prior to the beginning of construction of the power plant.

A second project that could help to provide adequate roadway access to the NMGS is the extension of Navajo 5 from the Burnham Trading Post east to a junction with N.M. 371. Navajo 5 is a paved, two-lane route that runs east from U.S. 666 to Burnham. The proposed junction with N.M. 371 would be located about 10 miles north of the NMGS, providing a paved route from the railway in Gallup to within 10 miles of the site. Although the survey work is completed, no construction schedule has been proposed for this extension. Completion of these two projects would provide alternative access routes to the site, thereby allowing traffic on the major north-south connecting roadways to be distributed throughout the system.

Two major transportation consequences would result from the construction and operation of the NMGS. The first involves the movement of construction materials and equipment to the proposed site of the NMGS. Although several alternatives and combinations of alternatives are being considered (PNM 1981), most haul routes would use portions of N.M. 371/57 and U.S. 666-Navajo 9. The only alternative that for the most part excludes truck transport of materials along N.M. 371 depends upon completion of the Star Lake or Con Paso railroad projects. These railroad lines would provide rail access directly to, or very near, the site of the NMGS and would reduce to a negligible level the 50-day period of hauling of equipment and materials to the site by truck along N.M. 371 and U.S. 666. If the rail service is unavailable, the continuous movement of materials, particularly oversized loads, along N.M. 371 or U.S. 666-Navajo 9 during the construction phase of the project would cause travel delays for normal commuters along the southern stretches from Interstate 40, would increase accident potential, and would require increased roadway maintenance along the entire route.

Most persons employed at the NMGS would commute south along the northern stretch of N.M. 371 from Farmington, Aztec, and Bloomfield to the Bisti area. The addition of approximately 650 vehicles per day during the peak employment years would affect the traffic flow along this two-lane roadway and increase accident potential, particularly as commuter vehicles mix with haul trucks. Further consequences related to safety and traffic congestion could occur on N.M. 44 south of Farmington to Huerfano if project personnel residing in the Bloomfield area chose to commute along C-15 to the plant site. This is also the route used by most visitors to Chaco Culture National Historical Park. This section of N.M. 44 is already congested with commute traffic and coal trucks. Degradation of the unimproved county road would also result from heavy use. If used by commuters in its present condition, significant impacts would occur along County Road 15. Further degradation to the unimproved road surface would result from regular traffic, particularly during inclement weather. Erosion and potholes would develop from improper drainage. Accident potential would be high because of narrow ROW and poor visibility (grade changes) along some sections. Dust would be a problem during the dry season.

Municipal Traffic Consequences

Farmington. Baseline population projections for Farmington show that substantial expansion and improvement of the Farmington street system will be required to meet future traffic-flow projections. The major east-west arterials (particularly U.S. 550, Main, Broadway, Bloomfield Highway, and San Juan Boulevard) and several major collectors (Apache, 20th, Airport, Dustin, and Butler) have average daily traffic flows sufficiently high to cause peak-hour traffic congestion. Travel delays are often substantial and can include waits of up to three complete cycles of traffic signals at major intersections along these collectors (Adcock 1981). Intersection accidents are also high along these major arterials.

Street-capacity estimating factors (Spon 1964) for streets of the type located in Farmington range from 900 to 2000 vehicles per hour (vph). If peak-hour traffic is assumed to constitute 10 percent of the average daily flow, almost half of the major arterials in Farmington exceed the upper limit of 2000 vph, and all but two exceed the lower limit of 900 vph. The population projections show that several of the arterials would approach twice the 2000-vph capacity by the year 2000.

Given the present street system, the proposed construction and operation of the NMGS would tend to exacerbate an already difficult situation. Preliminary estimates indicate that approximately 1000 NMGS employees would be located in northern Farmington and Aztec by 1987. To reach the proposed site of the NMGS, these workers would travel along N.M. 371. To gain access to N.M. 371, the commuters would pass directly through, or very near to, Farmington's central business district during peak hours. With a 2.1-2.2 vehicle occupancy, the addition of 650 vehicles to crosstown traffic during peak periods of the day would cause a significant increase (from 10 to 20 percent) over baseline traffic flows on major streets in Farmington. Traffic accidents would also increase along major corridors as traffic volume increases. Table 4-1 shows the estimated increase in traffic accidents along major roads in Farmington with

Table 4-1. ESTIMATED INCREASE IN INTERSECTION ACCIDENTS

Arterial	Average Daily Traffic-1980	Intersection Accidents 1980	Accident Ratio	Estimated Additional Accidents with 650 Added Vehicles/Day
Main	25,261	389	0.015	9.8
Broadway	13,601	92	0.007	4.6
San Juan	20,574	36	0.002	1.3
N.M. 64	20,687	33	0.002	1.3

NMGS commute traffic. This estimate is based on the ratio of accidents to daily traffic volume in 1980 and does not include future changes in traffic controls or total daily volume.

The present configuration of the street system in Farmington will be unable to accommodate the most optimistic projection of traffic-flow increases under baseline conditions, much less the vehicle movement associated with the NMGS. Proposed improvements to the Farmington municipal street system include two projects that might help to relieve the potentially serious traffic problems (Map 3-2). Proposals initiated as part of the City of Farmington Major Thoroughfare Plan (1977), but not yet approved by the state, include completion of a bypass route south of the central business district. This project would help to reduce congestion in the downtown area by providing a more direct route from U.S. 64 east of Farmington to U.S. 550 and the La Plata Highway west of Farmington. Construction would involve extending the Old Bloomfield Highway from its western terminus across the Animas and San Juan rivers to a junction with N.M. 371. The bypass would continue to a second crossing of the San Juan River and a junction with U.S. 550 and the La Plata Highway, a total distance of somewhat less than 4 miles. This improvement would not only facilitate the movement of traffic through Farmington but also provide better access to N.M. 371 (the route to the NMGS site) from the eastern portions of San Juan County.

A second major crosstown route for northern Farmington is also included in the Major Thoroughfare Plan. This project would extend 30th Street from U.S. 550 on the eastern side of Farmington to the La Plata Highway to the west, bypassing the central business district to the north of the municipal airport. This route would provide direct access from the main residential areas of Farmington to the highway system west of town. When the extension is completed, residents of this area will be able to commute between northern Farmington and points west (e.g., the San Juan Generating Station and coal mines) without entering the downtown area, thereby relieving some of the congestion problems in the central business district.

Several other major new construction, realignment, resurfacing, and improvement projects for Farmington's street system are underway or are planned for the near future. With the addition of these two major bypass routes (according to the Growth Management and Housing Plan for San Juan County [NMDFA 1981], preliminary work has already been funded) and several other improvement projects, traffic flow in Farmington could improve substantially in the future.

Aztec and Bloomfield. Although traffic-flow data for Aztec and Bloomfield are unavailable for 1980, the projected baseline population increases for those communities are approximately 37 percent for Aztec and 40 percent for Bloomfield by 2000. The proposed NMGS would increase these projections by about 3 percent for each community.

The community of Bloomfield would be most affected by an increase in traffic volume. The hazardous section of N.M. 44 that extends from the junction with U.S. 64 (near the southern municipal limit) through town would experience further deficiencies in safety and capacity.

TRANSMISSION LINES

No significant consequences to the transportation network have been identified for either the construction or operating phases of the transmission line alternatives. Temporary traffic delays could result where lines T2, T3, and T4 would cross N.M. 371 and during periods when large haul trucks used public roads to deliver construction materials to the site.

WATER SUPPLY SYSTEM

No significant transportation consequences have been identified for any of the water supply system components. Minor, temporary disruptions to traffic flow could occur during construction along roadway segments crossed by or parallel to the pipelines. Proposed pipeline P1 would cross N.M. 371, and pipeline P3 would cross N.M. 44.

5.0

MITIGATION MEASURES

Significant transportation consequences would result from the movement of both materials and project personnel to the proposed plant site via major arterials from Farmington in the north and from Gallup/Prewitt in the south. Some of the consequences identified are directly related to existing highway deficiencies (roadway foundation, surfacing, safety, and capacity), which would be substantially reduced by programmed roadway improvements under the NMSHD five-year program. The other influential factor would be the addition of rail lines to serve the area, relieving extensive use of N.M. 57/371 and U.S. 666-Navajo 9 for truck traffic during the construction phase of the project. Still another influential factor would be the use of off-road haul routes by trucks carrying construction materials. Further reduction in the number of commute vehicles associated with NMGS would result from an active encouragement of company personnel and contractors to share rides or use private contractor commute buses. PNM could initiate an origin-destination commute file for company personnel and provide assistance in arranging ride-sharing programs for employees. The U.S. Department of Transportation and state Department of Transportation have documents available to private companies describing the organization, implementation, and incentives for various types of ride-sharing programs.

6.0

UNAVOIDABLE ADVERSE IMPACTS

Significant transportation consequences could be avoided or reduced through implementation of the range of alternatives possible for distributing traffic among major roadway and proposed rail corridors.

7.0

RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE AFFECTED ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Roadways improved (surfacing, widening) to accommodate increases in traffic volume along major roads used for energy development would remain as useful transportation corridors. Temporary disruptions from the movement of construction equipment and personnel along these roads (N.M. 371, U.S. 666, N.M. 57) would occur during the construction phase of the project.

8.0

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

There would be no irreversible or irretrievable commitments of resources.

9.0
COMPARISON OF ALTERNATIVES

FUEL CONSUMPTION AND SUPPLY

The Proposed Action was considered in this assessment and included the use of available coal in close proximity to the plant site, thus reducing the necessity for long-haul truck traffic between mines and plant. An alternative source that was considered is other San Juan Basin coal producers within 30 miles of the plant site. Coal would be hauled by truck from these mines in 120-ton trucks over 250 haul-days per year. Based on the worst case, approximately 300 round trips per haul-day would be required. This alternative would exacerbate the consequences already described for roadways providing access to the plant site (primarily N.M. 371/57 from Thoreau to Bisti, Navajo 9, N.M. 44, and U.S. 666). Accidents would increase and road maintenance requirements would increase along these arterials.

POSSIBLE NEW TOWN

1.0

AFFECTED ENVIRONMENT

The possible new town site would be located along San Juan County Road 15 (unimproved) approximately midway between N.M. 371 on the west and N.M. 44 on the east. Current traffic on these narrow graded dirt roads is estimated to be fewer than 20 vehicles a day. There are no ditches or culverts for roadway drainage, making the roads nearly impassable during inclement weather.

Safety is one of the primary deficiencies of highways and roads in the San Juan-McKinley County network. Other regional considerations are discussed in the NMGS EIS.

2.0

ENVIRONMENTAL CONSEQUENCES

Residential development along the unimproved county road would require upgrading of the road by San Juan County to accommodate regular vehicular traffic. At a minimum, the road would require drainage ditches, culverts, and surfacing for use during inclement weather. Potential positive consequences could result from the possible new town development once the access road is improved. Specifically, commute traffic would be reduced during peak hours on N.M. 371 from Farmington to the plant site.

3.0

MITIGATION

Under the assumption that the possible new town could be located in the general vicinity of the NMGS plant site, accessible to the plant via County Road 15, San Juan County would require road improvements (paving, culverts, intersection controls, drainage) prior to issuing a use permit for development of the site. Under use permit requirements, the applicant would include road improvements at full or shared costs with the county. These improvements would negate significant impacts to the existing unimproved road and would relieve impacts (traffic congestion and safety) identified for N.M. 371 by distributing commute traffic.

The development of a new town, with associated road improvements to County Road 15 (required by county ordinance) would relieve commute problems along N.M. 371 by distributing traffic volume along access roads to the plant site. Road improvements (grading, drainage, and surfacing) on C-15, even without the new town, would reduce consequences along this roadway if used by commuters.

GLOSSARY

ADT - average daily traffic; the average number of vehicles passing a given point during a 24-hour period.

Area of influence - the communities of Farmington, Aztec, and Bloomfield; major roadways connecting the proposed NMGS site with these communities, and extending south to connect with roadways and rail service at Gallup and Prewitt.

Deficient roadway - does not meet state highway rated average for foundation, surface, drainage, safety, or capacity.

Long-term impacts - traffic congestion and additional roadway maintenance lasting over 6 months.

Short-term impacts - traffic congestion and additional roadway maintenance over a period of 3-6 consecutive months.

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PREPARERS

BLM, New Mexico State Office

Project Manager: Leslie M. Cone
Technical Reviewer: Ronald S. Druva

Woodward-Clyde Consultants

Project Manager: Janice R. Hutton
Task Leader: Marilyn Duffey-Armstrong

CONSULTATION AND COORDINATION

Adcock and Associates, Inc., Albuquerque.

City of Farmington, Planning Department.

Public Service Company of New Mexico, Albuquerque.

University of New Mexico, Division of Government Research.

Santa Fe Mining Company, Albuquerque.